

**WHAT IS CLAIMED IS:**

1. A transmitted-light illumination device for a microscope, comprising:
  - a light source configured to generate an illuminating light beam incident onto an object plane of an object to be imaged with the microscope, said illuminating light beam defining an optical axis;
  - a collector lens;
  - a field diaphragm;
  - an aperture diaphragm;
  - exactly one condenser lens system, said condenser lens system configured to be switchable into and out of the illuminating light beam; and
  - a focusing lens positioned between said field diaphragm and said aperture diaphragm, said focusing lens configured to be displaceable along the optical axis.
2. A transmitted-light illumination device for a microscope as defined in Claim 1, further comprising an electrical control apparatus configured to switch the condenser lens system into and out of the illuminating light beam.
3. A transmitted-light illumination device for a microscope as defined in Claim 1, further comprising a spindle motor configured to controllably displace said focusing lens along the optical axis.
4. A transmitted-light illumination device for a microscope as defined in Claim 2, further comprising a spindle motor configured to controllably displace said focusing lens along the optical axis.
5. A transmitted-light illumination device for a microscope as defined in Claim 1, wherein said condenser lens system is configured to be mechanically switchable into and out of the illuminating light beam.

6. A transmitted-light illumination device for a microscope as defined in Claim 1, wherein the illumination device is configured so that: a) an illumination of said object plane corresponding to an objective magnification range of approximately 10X to 100X is provided when said condenser lens system is switched into the illuminating beam path; and b) an illumination of said object plane corresponding to an objective magnification range of approximately 1X to 5X is provided when said condenser lens system is switched out of the illuminating beam path.
7. A transmitted-light illumination device for a microscope as defined in Claim 2, wherein the illumination device is configured so that: a) an illumination of said object plane corresponding to an objective magnification range of approximately 10X to 100X is provided when said condenser lens system is switched into the illuminating beam path; and b) an illumination of said object plane corresponding to an objective magnification range of approximately 1X to 5X is provided when said condenser lens system is switched out of the illuminating beam path.
8. A transmitted-light illumination device for a microscope as defined in Claim 3, wherein the illumination device is configured so that: a) an illumination of said object plane corresponding to an objective magnification range of approximately 10X to 100X is provided when said condenser lens system is switched into the illuminating beam path; and b) an illumination of said object plane corresponding to an objective magnification range of approximately 1X to 5X is provided when said condenser lens system is switched out of the illuminating beam path.
9. A transmitted-light illumination device for a microscope as defined in Claim 4, wherein the illumination device is configured so that: a) an illumination of

said object plane corresponding to an objective magnification range of approximately 10X to 100X is provided when said condenser lens system is switched into the illuminating beam path; and b) an illumination of said object plane corresponding to an objective magnification range of approximately 1X to 5X is provided when said condenser lens system is switched out of the illuminating beam path.

10. A transmitted-light illumination device for a microscope as defined in Claim 6, wherein said aperture diaphragm and said field diaphragm exchange their optical functions when said condenser lens system is switched out of the illuminating beam path.
11. A transmitted-light illumination device for a microscope as defined in Claim 10, wherein, when said condenser lens system is switched out of the illuminating beam path, said focusing lens is displaced such that said field diaphragm is focused into the object plane.
12. A transmitted-light illumination device for a microscope as defined in Claim 7, wherein said aperture diaphragm and said field diaphragm exchange their optical functions when said condenser lens system is switched out of the illuminating beam path.
13. A transmitted-light illumination device for a microscope as defined in Claim 12, wherein, when said condenser lens system is switched out of the illuminating beam path, said focusing lens is displaced such that said field diaphragm is focused into the object plane.
14. A transmitted-light illumination device for a microscope as defined in Claim 8, wherein said aperture diaphragm and said field diaphragm exchange their

optical functions when said condenser lens system is switched out of the illuminating beam path.

15. A transmitted-light illumination device for a microscope as defined in Claim 14, wherein, when said condenser lens system is switched out of the illuminating beam path, said focusing lens is displaced such that said field diaphragm is focused into the object plane.
16. A transmitted-light illumination device for a microscope as defined in Claim 9, wherein said aperture diaphragm and said field diaphragm exchange their optical functions when said condenser lens system is switched out of the illuminating beam path.
17. A transmitted-light illumination device for a microscope as defined in Claim 16, wherein, when said condenser lens system is switched out of the illuminating beam path, said focusing lens is displaced such that said field diaphragm is focused into the object plane.
18. A transmitted-light illumination device for a microscope as defined in Claim 1, wherein said condenser lens system comprises exactly one lens.
19. A transmitted-light illumination device for a microscope as defined in Claim 1, wherein said condenser lens system comprises a plurality of lenses.
20. A microscope having a transmitted-light illumination device, comprising:
  - a light source configured to generate an illuminating light beam incident onto an object plane of an object to be imaged with the microscope, said illuminating light beam defining an optical axis;
  - a collector lens;
  - a field diaphragm;

an aperture diaphragm;  
exactly one condenser lens system, said condenser lens system configured to be switchable into and out of the illuminating light beam; and  
a focusing lens positioned between said field diaphragm and said aperture diaphragm, said focusing lens configured to be displaceable along the optical axis.

21. A microscope as defined in Claim 20, wherein said condenser lens system comprises exactly one lens.
22. A microscope as defined in Claim 20, wherein said condenser lens system comprises a plurality of lenses.
23. A microscope having a transmitted-light illumination device, comprising:  
a light source configured to generate an illuminating light beam incident onto an object plane of an object to be imaged with the microscope, said illuminating light beam defining an optical axis;  
a collector lens;  
a field diaphragm;  
an aperture diaphragm;  
a condenser lens system, said condenser lens system configured to be switchable into and out of the illuminating light beam; and  
a focusing lens positioned between said field diaphragm and said aperture diaphragm, said focusing lens configured to be displaceable along the optical axis,  
wherein the illumination device is configured so that: a) an illumination of said object plane corresponding to an objective magnification range of approximately 10X to 100X is provided when said condenser lens system is switched into the illuminating beam path; and b) an illumination of said object plane corresponding to an objective magnification range of

approximately 1X to 5X is provided when said condenser lens system is switched out of the illuminating beam path.

24. A microscope having a transmitted-light illumination device, comprising:
- a light source configured to generate an illuminating light beam incident onto an object plane of an object to be imaged with the microscope, said illuminating light beam defining an optical axis;
  - a collector lens;
  - a field diaphragm;
  - an aperture diaphragm;
  - a condenser lens system, said condenser lens system configured to be switchable into and out of the illuminating light beam; and
  - a focusing lens positioned between said field diaphragm and said aperture diaphragm, said focusing lens configured to be displaceable along the optical axis,
- wherein the illumination device is configured so that: a) an illumination of said object plane corresponding to an objective magnification range of approximately 10X to 100X is provided when said condenser lens system is switched into the illuminating beam path; and b) an illumination of said object plane corresponding to an objective magnification range of approximately 1X to 5X is provided when said condenser lens system is switched out of the illuminating beam path, and
- wherein said aperture diaphragm and said field diaphragm exchange their optical functions when said condenser lens system is switched out of the illuminating beam path.
25. A microscope as defined in Claim 24, wherein, when said condenser lens system is switched out of the illuminating beam path, said focusing lens is displaced such that said field diaphragm is focused into the object plane.